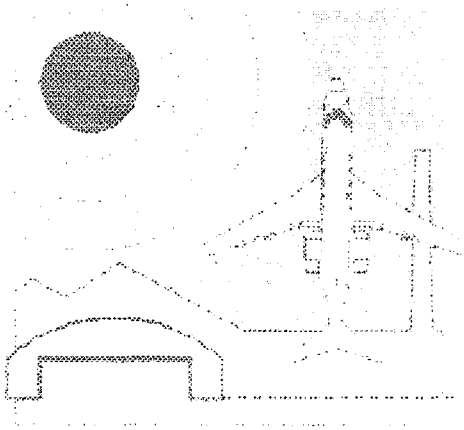
SECTION 6: FACILITY REQUIREMENTS



BISBEE-DOUGLAS INTERNATIONAL AIRPORT
Douglas / Cochise County, Arizona

AIRPORT MASTER PLAN - 1997

SECTION 6:
FACILITY REQUIREMENTS

INTRODUCTION

The 1994 Cochise County Regional Airport System Plan (RASP) stated that its goal was "*to determine the future aviation activity and demand at airports within Cochise County, in order to plan for the future growth, improvements and expansion of these airports. With this information, ADOT Aeronautics will be able to allocate funds for maintenance, improvements and/or expansion of County airports without providing for redundant facilities.*"

Although the 1994 RASP study addressed the possibility of closure of one or more airports within the County, the conclusion was that each existing airport serves (or will serve) a specific "niche" market, and that design and future improvements should be tailored to fit these specifics. The RASP concluded with the statement that ". . . *the consolidation/closure of airport facilities in Cochise County is not considered to be a realistic option under the current conditions.*"

A part of this Master Plan study is the definition of the specific niche markets that will be served by the BDI Airport. The capability of an airport to meet the demands of identified markets is, in part, determined by its location and site characteristics. Other factors include the willingness of the airport owner to promote the airport to potential users and to fund necessary improvements, and the actual availability of funding.

GENERAL COMPARISON OF KEY COMPETITIVE SERVICE AREA AIRPORTS

The BDI site is superior to either of the two nearest competing public-ownership airports (Bisbee Municipal and Douglas Municipal) in terms of its geographic location, existing and potential airspace and land use conflicts, potential for noise impacts, instrument approach capability, and general development potential.

The following is a general descriptive comparison of some key factors that must be recognized when appropriating funding for the recommended improvements to the BDI Airport facilities.

Airspace Considerations

Cochise County is bounded on the south by the U.S./Mexico international border, which is paralleled by the Contiguous U.S. Air Defense Identification Zone (ADIZ).

The southern half of the County is overlain by several Military Operations Areas (MOA's) and Restricted Areas, which are used extensively for Air Force and Air National Guard training operations. All three of the competing airfields (Bisbee, Douglas and BDI) are located beneath the Tombstone C MOA, which extends from 14,500' MSL up to, but not including Flight Level 180 (18,000' MSL). This MOA does not significantly affect operations arriving and departing from any of these airports.

Bisbee Municipal Airport is located about 1½ nautical miles north of the U.S./Mexico border (and the ADIZ). Aircraft departing to the south may enter Mexican airspace. The R-2303C Restricted Area is only 7 miles to the west.

The Douglas Municipal Airport is immediately adjacent to the U.S./Mexico border, and is actually located within the ADIZ. Aircraft arriving from or departing to the southwest must overfly Mexican airspace. Although this is a common practice at this facility, it is technically illegal and violates most aviation insurance policies.

The Bisbee-Douglas International Airport is located about eight (8) nautical miles north of the border and ADIZ. Because of this buffer, arriving and departing aircraft are assured of adequate airspace while maneuvering south of the airport.

Geographic Constraints, Terrain, and Compatible Land Use

Cochise County's terrain consists of several mountain chains separated by broad valleys. The western boundary of the County passes through the Whetstone Mountains and Apache Peak (elevation 7,711'). The southwestern corner of the County contains the Huachuca Mountains, with peak elevations ranging between 7,275' and 9,466'. The Bisbee-Warren area is dominated by the Mule Mountains, with peaks at 7,180' and 7,370'.

The defining feature of eastern Cochise County is the Chiricahua Mountains, which rise to an elevation of 9,759'. The Sulphur Springs Valley extends north and northwest from the U.S./Mexico border for more than 100 miles. The valley floor in the Bisbee-Douglas area is at 4,000' MSL.

Bisbee Municipal Airport is located less than 5 miles south and west of rapidly rising terrain (the Mule Mountains). Aircraft departing north from the Bisbee Municipal Airport will pass directly over the mountain communities of Warren (3 miles north), and Bisbee (4 miles north). Although noise has never been specifically identified as an issue at Bisbee, an increase in use by business jets may significantly impact these communities, and safety of operations by departing aircraft may also be an issue as traffic increases. For instance, in order to attain a safe altitude of 1,000' above the community of Warren, an aircraft departing Bisbee to the north would need to achieve and maintain a rate of climb of nearly 1,000 feet per minute, or 575 feet per mile. Smaller aircraft operating at their gross weights may have difficulty achieving this rate, especially during the summer when temperatures frequently exceed 90° Fahrenheit.

The Douglas Municipal Airport is about 5 miles southwest of the southern foothills of the Chiricahua Mountains. In order to clear this terrain by 500', aircraft departing to the east would need to attain a rate of climb of 500 feet per mile (nearly 850 feet per minute). Normally, departing aircraft would simply turn to the north to avoid high terrain, but this scenario may be hazardous during periods of low visibility.

The City of Douglas is located beneath the downwind traffic pattern for the Douglas Municipal Airport. Aircraft noise may become an issue here with an increase in business jet traffic over residential areas, schools and local businesses.

Bisbee-Douglas International Airport is located in the middle of the broad Sulphur Springs Valley, with no nearby restrictive terrain. The Mule Mountains are some 15 miles to the west. Swisshelm Mountain, at the south end of the Chiricahua range, is 15 miles to the north.

The BDI Airport is 8 miles northwest of the City of Douglas. There are no incompatible land uses adjacent to the airport.

Instrument Approach Capability

Of the three key service area airfields, only the BDI Airport has a published instrument approach procedure. Two are provided, both of which are of the "non-precision" variety, providing only horizontal guidance to the arriving aircraft. No electronic glideslope guidance is provided. The current procedure requires a minimum of one mile visibility (greater for faster aircraft) and a cloud ceiling of 500 feet above the ground for aircraft arriving under actual Instrument Meteorological Conditions (IMC).

Because of the very low incidence of actual IMC in the area, the BDI approach is mainly used for training. However, in order to be attractive to future business users or scheduled airlines, an airport must provide a reasonable level of all-weather utility.

The Bisbee Municipal Airport is constrained by rapidly rising terrain to the north, northwest and east, and by its proximity to the U.S./Mexico border and ADIZ. A published instrument approach is probably not feasible at this site.

The Douglas Municipal Airport is constrained by its immediate proximity to the U.S./Mexico border. Any instrument approach to the Douglas runway would require aircraft to enter Mexican airspace. Since Mexican airspace cannot be controlled by the U.S. government, an instrument approach procedure would not be possible at this site.

As mentioned above, the Bisbee-Douglas International Airport already has an existing non-precision approach capability. In addition to providing this service to the region, the BDI site would also allow installation of a "precision" approach, such as an Instrument Landing System (ILS), Differential Global Positioning System (DGPS), or Transponder Landing System (TLS). These systems provide a vertical glideslope, and would allow approaches to minimums of as low as ½ mile visibility and descent to 200 feet. No additional land acquisition would be required for these installations, assuming that the approach would terminate with a landing on Runway 17.

Both the Bisbee Municipal and Douglas Municipal airports are apparently destined to remain VFR-only facilities. The BDI Airport, however, has the potential for full ILS/DGPS/TLS capability.

HISTORICAL SIGNIFICANCE OF THE BDI AIRPORT

As was presented in Section 1, the Bisbee-Douglas International Airport has a unique history, dating from its original role as a major training base for World War II aviators and continuing as a postwar regional airline service facility.

The airport's buildings were all originally constructed during the war as part of the Douglas Army Airfield. The existing Terminal Building was originally the airbase's administration building. It was remodeled in 1949 to serve as an airline terminal, and is one of very few remaining examples of 1950's-era terminals in the country. The three existing steel-constructed hangars (Hangars #1, 2 and 3) are in much the same as originally constructed by the War Department, except for some interior modifications. The large wood-frame hangar (Hangar #4) is a masterpiece example of wartime use of timber as a substitute for steel, which was needed for construction of aircraft, vehicles, ships and tanks.

Consideration should be given for preservation of portions of the BDI Airport as a historic site. It is recommended that Hangars #1, #2, #3 and #4 be restored to their World War II configurations. Hangar #2 is a prime site for a privately-operated Air Museum, or similar use. Hangars #1 and #3 would serve as good locations for aircraft/aviation-related manufacturing businesses, or may be maintained for aircraft storage. (Hangar #1 is currently being used for assembly of kit-constructed and "homebuilt" aircraft).

The Terminal Building could be restored to its 1950's-era airline terminal configuration, and maintained as such.

Funding of building restorations may be available through State and/or federal Historic Preservation Grants.

Identification of Specific Niche Markets for BDI

The following is a list of some specific "niche" markets that the BDI Airport could serve. Most of the service roles suggested are best provided by private enterprize.

Significant improvements to the present airport infrastructure are needed to effectively serve any of these suggested markets. The focus of the County should be to provide an adequate airport facility to serve any of these markets, and then to provide an aggressive marketing effort to attract new business to provide the suggested services.

- Regional Business Aviation Center for Cochise County, providing accommodation of business jets and turboprops, with full precision instrument approach capabilities, and with service and accommodations for arriving pilots and passengers.

  Requirements:
  Precision Instrument Approach.
  Runways able to accommodate business jets.
  Pilot Lounge and briefing room.
  Passenger Lounge/waiting area.
  Short-term hangar space.
  Coffee Shop.
  Aircraft repair services and jet fuel.

- Auxiliary General Aviation/Military Training Center, providing a nearby instrument training site to Cochise College students, Air Force and the Air National Guard.

  Requirements:
  Precision Instrument Approach.
  Runway able to accommodate military trainers.
  Pilot Lounge and briefing room.
  Auxiliary classrooms.
  Coffee Shop.
  Jet fuel availability.

- Historic Site and Southeastern Arizona Sport Aviation Center, providing a focal point for tourism activities and a staging site for sport aviation events, such as the Copperstate Fly-in, locally-sponsored air shows, or Experimental Aircraft Association functions.

  Requirements:
  Restoration of existing buildings.
  Aviation Museum and/or Interpretive Center.

A large transient tiedown apron(s).
Coffee Shop.
Large auto parking area(s).
Air show staging area ("historic site" ramp).

- Cochise County Airport Industrial Park, providing improved development sites for new industry and an interface between commercial truck and air freight transit. The BDI Airport site is strategically placed to serve as a warehousing, manufacturing, or corporate base for emerging or expanding *Maquilladora* companies - those who engage in international trade with facilities on both sides of the Mexico/U.S. border.

  Requirements: Planned Industrial Park.
  Improved utilities service infrastructure.
  Improved vehicular access to industrial sites.

The specific niche market areas presented above may be considered unique parts of an aggregate market base for the BDI Airport. Although each niche market area will have its own specific improvement needs, there is sufficient overlap between the areas that a broad-based marketing effort can be undertaken.

There does not appear to be any apparent significant conflict between the recommended uses. With careful planning, the BDI Airport could serve several specific markets and enjoy a broad base of airport revenue.

Cost estimates for recommended building improvements are included in the Preliminary Airport Building Budget Projections at the end of this section (beginning on Page 6-34).

General Requirements and Criteria

Any growth in local aviation related activities or change in existing or anticipated use of an airport facility requires a corresponding program of airport development and implementation. This is necessary in order to assure that the facility remains able to effectively accommodate its demand and to effectively serve its market.

In order to provide for the demands on the BDI Airport, a schedule of facility improvements has been developed, based on an inventory of the existing airport facilities and the development of forecast aircraft activity through the twenty-year planning period.

The facility requirements were developed accepting the following criteria:

- The dimensional standards and design criteria for all improvements proposed within the planning period shall be as detailed in FAA Advisory Circular AC 150/5300-13, Airport Design. A printout from the FAA's Airport Design program is included at the end of this section. This includes all applicable dimensional criteria for the existing and ultimate airport configurations.

- The existing critical aircraft is a range of ARC B-I, B-II, and C-I business jets and turboprops, as detailed in Section 4.

- The forecast critical aircraft is potentially a range of ARC C-II business jets and turboprops. Activity by these types may potentially increase to 3,800 annual operations by the year 2016, and may include significant activity by aircraft with takeoff weights of up to 60,000 pounds.

The following narrative contains a discussion of each recommended item of development. Each element includes recommendations for improvements to meet the Short-Term (2000-2005), and the Ultimate (2006-2016) demand. Recommendations for action in the Immediate Term (1997-1999) are included when a deficiency has been defined which requires immediate correction.

Summary tables for recommended Immediate, Short-Term and Ultimate development are included at the end of this section.

PRIMARY RUNWAY REQUIREMENTS

At the present time, the condition of Runway 17-35 dictates its use as the primary runway at BDI.

Runway 17-35 is 7,300 feet in length and 150' in width (the FAA's record surveyed length of the existing pavement is 7,289.61'). The following section (Alternatives Analysis) will present options for future development of the primary runway, including the option of designation of another runway for primary use.

The FAA's AC 150/5325-4A, Runway Length Requirements for Airport Design recommends the following runway lengths for an airport at an altitude of 4,151 MSL, with a mean daily maximum temperature of 90° Fahrenheit:

FAA AC 150/5325-4A Runway Length Recommendations for Bisbee-Douglas International Airport

Small airplanes (12,500 pounds or less):	
with approach speeds of less than 30 knots	420 feet
with approach speeds of less than 50 knots	1,130 feet
Small airplanes with less than 10 passenger seats:	
75 percent of these small airplanes	4,070 feet
95 percent of these small airplanes	5,340 feet
100 percent of these small airplanes	5,650 feet
Small airplanes with 10 or more passenger seats	5,650 feet
Large airplanes of 60,000 pounds or less:	
75 percent of these large airplanes at 60% useful load	6,690 feet
75 percent of these large airplanes at 90% useful load	9,040 feet
100 percent of these large airplanes at 60% useful load	8,920 feet
100 percent of these large airplanes at 90% useful load	10,480 feet

In determining the critical aircraft fleet that might use the BDI Airport after improvements are made, the approximate takeoff runway requirements were calculated for several ARC B-I, B-II, C-I and C-II propeller and jet aircraft types (see Section 3, pages 3-23 through 3-28).

The most critical of these are presented in the tabulation on the following page:

ARC B-I, B-II, C-I and C-II Critical Aircraft Fleet
for Bisbee-Douglas International Airport

Aircraft	Takeoff Weight	Aircraft Reference Code	Runway Length Required
Cessna Citation I/SP	11,850#	ARC B-I	4,167'
Beechcraft B-200	12,500#	ARC B-II	4,247'
Metro II SA226-TC	12,500#	ARC B-I	4,342'
Cessna 340A	5,990#	ARC B-I	4,445'
Learjet 28/29	15,000#	ARC B-I	4,495'
Cessna 421C	7,450#	ARC B-I	4,689'
Cessna 402C	6,850#	ARC B-I	4,839'
Cessna 441	9,850#	ARC B-II	4,863'
Learjet 24B	13,500#	ARC C-I	4,893'
Lockheed Jetstar II	44,500#	ARC C-II	4,948'
Cessna 425	8,600#	ARC B-I	5,050'
Beechcraft B-100	11,500#	ARC B-I	5,144'
Cessna 414A	6,750#	ARC B-I	5,473'
Cessna 310R	5,500#	ARC B-I	5,626'
Falcon 10	18,740#	ARC B-I	5,891'
Falcon 50	37,480#	ARC B-II	5,891'
Learjet 31	16,500#	ARC C-I	5,909'
Falcon 20	26,000#	ARC B-II	5,990'
Merlin IVC	16,000#	ARC B-II	6,044'
Sabreliner NA-265-80	19,000#	ARC C-II	6,190'
Learjet 25D/F	15,000#	ARC C-I	6,198'
Sabreliner NA-265-65	19,000#	ARC B-II	6,241'
Learjet 25B/C	15,000#	ARC C-I	6,289'
Gulfstream I	34,000#	ARC B-II	6,342'
Metro III	16,000#	ARC B-I	6,393'
Lockheed Jetstar	34,000#	ARC C-II	6,640'
Embraer EMB-120	25,353#	ARC B-II	6,642'
Saab-Fairchild SF340A	28,000#	ARC B-II	6,690'
Learjet 23	12,000#	ARC C-I	6,789'
Sabreliner NA-265-40	18,650#	ARC B-I	6,989'
Falcon 900	45,500#	ARC B-II	7,093'
Saab 340B	30,000#	ARC B-II	7,236'
IAI Westwind 1124	22,850#	ARC C-I	7,277'
Falcon 200	30,650#	ARC B-II	7,480'
Gulfstream III	69,700#	ARC C-II	7,738'
IAI Westwind 1124A	23,500#	ARC C-I	7,773'
Learjet 55C	21,500#	ARC C-I	7,978'
Sabreliner NA-265-60	20,000#	ARC B-I	8,037'
Sabreliner NA-265-80A	25,500#	ARC C-II	8,088'
Westwind Astra	24,650#	ARC B-II	8,639'

Source: AcData v6.10, Density Altitude= 6,978' (4,100' MSL / 90 ° F)

The existing length of Runway 17-35 (7,300') will accommodate the present critical aircraft mix, as well as many of the potential ultimate ARC C-II critical aircraft fleet. However, future increases in activity by larger business or air carrier aircraft may dictate a runway extension.

Immediate Requirements:

Because of the present condition of the runway pavements, the initial improvement program should include rehabilitation or reconstruction of the designated primary runway.

The primary runway to serve BDI in the short term should maintain the present length of 7,300 feet. However, to meet the FAA criteria for an ARC C-II facility, the present pavement width of 150 feet may be reduced to 100 feet. According to the FAA criteria, the 7,300' length will accommodate 100% of small airplanes (12,500 pounds or less) with 10 or more passenger seats, as well as many heavier aircraft.

Runway 17-35's existing pavement was originally designed to accommodate heavy military aircraft. However, the present condition of the pavement is such that its rehabilitation or reconstruction should be considered an immediate priority. Pavement strength should be designed and maintained to accommodate a 30,000 pound SWG business jet or turboprop, and design should allow for the possibility of a future upgrade to 60,000 pound design strength.

Initial runway reconstruction should be designed such that a precision instrument approach and approach lighting array may be installed without being impacted by a future runway extension.

Based on the existing instrument approach, the initial pavement markings should conform to the requirements for an instrument runway with an approach to visibility minimums of ¾ mile or greater.

Ultimate Requirements:

Runway 17-35 is adequate in terms of length to accommodate the present critical aircraft, but may require upgrade to accommodate increased operations by large aircraft at some point within the planning period of this study. Depending upon actual increases in activity by larger aircraft, the pavement strength may require upgrade to serve 60,000 pound aircraft, and the runway length may need to be extended to 8,700 feet *(this will require an Environmental Assessment).*

The primary runway at BDI should be equipped with an instrument approach to lower than ¾ mile visibility (a "precision" approach). This may be an Instrument Landing System (ILS), Differential Global Positioning System (DGPS), or a Transponder Landing System (TLS).

Ultimate pavement markings should conform to the requirements for an instrument runway with an approach to visibility minimums of less than ¾ mile.

CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a secondary (crosswind) runway be developed if the wind coverage on the primary runway is less than 95% (see FAA AC 150/5300-13, Change 4, paragraph 203. b.). A crosswind runway may also be justified based on specific local conditions.

Wind analysis undertaken as a part of this study indicates that the present Primary runway (17-35) has 98.63% coverage, using the BDI Airport Annual/All-Weather data for the 1986-1996 period (see Section 2, Inventory of Existing Conditions, page 2-21 through 2-23). As a matter of fact, the wind analysis indicates that any of the active or abandoned runways' wind coverage would exceed the FAA's 95% threshold. Based on the annual data, the need for a crosswind runway is not indicated. However, further analysis indicates that there is a great disparity in wind coverages along the various alignment when the wind is over 16 knots. Runway 3-21 has 83.14% coverage in these higher wind conditions, as opposed to Runway 8-26 (the present crosswind strip) with 73.95% or Runway 17-35 with only 47.87%. Abandoned Runway 12-30 has only 37.14% coverage when winds are over 16 knots.

The recommendation of this study is to plan for the development of a crosswind runway in the future, in order to increase the safety of the airport in high wind conditions.

The existing crosswind runway (8-26) is paved and 7,000' in length, with a pavement width of 150'. Runway 8-26 was found to be in poor condition (see Section 2) and in need of immediate rehabilitation if it to remain an active runway. The following section of this study (Alternatives Analysis) will provide recommendations regarding which runways should be designated as the primary and secondary (crosswind) runway.

The recommended length of a crosswind runway is 80% of the required length of the main runway for the type of aircraft to be served. At the BDI Airport, a crosswind runway which would serve most ARC C-II class aircraft would need to be a minimum of 7,000' long. The required length to serve most light singles would be approximately 5,850' long.

Immediate Requirements:
Because of its poor condition, it is recommended that the existing crosswind Runway 8-26 be closed as soon as possible to mitigate possible compromises to safe operations. This may be accomplished by publishing the closed status of the runway through FAA Notices to Airmen (NOTAMS), as well as marking the runway as closed in accordance with FAA Advisory Circular AC 150/5340-1.

Short-Term Requirements:
Initially, a crosswind runway which is 80% of the length of the recommended 7,300' primary runway should be developed (5,850'). To meet the FAA criteria for an ARC C-II facility, the present pavement width of 150 feet may be reduced to 100 feet.

Pavement strength should be designed and maintained to accommodate a 30,000 pound SWG business jet or turboprop, and design should allow for the possibility of a future upgrade to 60,000 pound design strength.

Based on the existing instrument approach, the initial pavement markings should conform to the requirements for an instrument runway with an approach to visibility minimums of ¾ mile or greater.

Ultimate Requirements:
Depending upon actual increases in activity by larger aircraft, the pavement strength of the crosswind runway may require upgrade to serve 60,000 pound aircraft, and the runway length may need to be extended to 80% of the recommended 8,700' ultimate primary runway length (7,000').

The crosswind runway at BDI should ultimately be served by a straight-in instrument approach to greater than ¾ mile visibility (a "nonprecision" approach). Ultimate pavement markings should conform to these criteria.

INSTRUMENT APPROACHES AND NAVIGATIONAL AIDS

Federal Aviation Regulations, Part 91.116 (c) indicate that an aircraft attempting to land under IFR conditions, on a published instrument approach procedure, may not descend below the established Minumum Decent Altitude (MDA) unless at least the runway threshold, the threshold markings, the threshold lights, REILs, VASI lights, the runway lights, the touchdown zone lights or markings, or the approach lights are distinctly visible to the pilot.

The BDI Airport is currently served by two published instrument approach procedures. These are a VOR/DME or GPS RWY 17 approach, and a VOR RWY 17 procedure. The currently published minimums are listed in the following table. The figures shown for each category of aircraft represent the MDA in feet AGL and visibility in statute miles.

Current Instrument Approach Minimums
Bisbee-Douglas International Airport - 1997

	Aircraft Category			
	A	B	C	D
VOR/DME or GPS RWY 17:				
Straight-In	300-1	300-1	300-1	300-1
Circling	500-1	500-1	500-1½	600-2
VOR RWY 17:				
Straight-In	500-1	500-1	500-1¼	500-1½
Circling	500-1	500-1	500-1½	600-2

Consideration should be given to increasing the all-weather utility of the airport by installation of improvements which would allow lower approach minimums at the field.

The current visibility minimums could be improved somewhat by installation of approach lighting aids. A runway with only medium intensity edge lighting (MIRL) is limited to a one mile visibility minimum. Installation of an Omni Directional Approach Lighting system (ODAL) could bring the visibility minimums down to ¾ mile, assuming that there are no obstructions to approach surfaces. Medium

Intensity Approach Lights with Sequenced Flashers system (MALSF), or Medium Intensity Approach Lights with Runway End Identifier Lights (MALSR) could possibly bring the visibility minimums down to ½ mile.

Immediate Requirements:
The Immediate Term program should include removal of any identified obstructions to FAR Part 77 surfaces, and provision of a nonprecision approach procedure to the Primary runway (with visibility minimums of 1 mile, using the existing VOR station). If Runway 17-35 remains as the Primary runway, the current approaches will suffice.

Short-Term Requirements:
The Short-Term program should include the installation of a MALSR system on the Primary runway approach. This will provide a safer environment for arriving aircraft and may bring the visibility minimums down to as low as ¾ mile.

Ultimate Requirements:
An Instrument Landing System (ILS), Differential Global Positioning System (DGPS) transmitter, or Transponder Landing System (TLS) should be installed, and an approved "precision" approach procedure to less than ¾ mile should be established, as predicated by actual demand.

TAXIWAY REQUIREMENTS

The FAA suggests that, for safety reasons, a full parallel taxiway may be justified when an airport's total annual operations reach 20,000. According to the forecasts generated for this study (see Section 3), this level may be reached within the next five years, if significant improvements are made to the airfield.

Full or partial parallel taxiway construction may also be justified prior to reaching this"rule-of-thumb" level of operation if the construction will better serve existing or proposed hangar, terminal, aprons, or other public-use facilities.

Immediate Requirements:
Virtually all of the BDI Airport's taxiway pavements are in poor condition at the present time. It is recommended that immediate steps be taken to provide a useable taxiway system to serve all active runways, aircraft parking areas and hangars. This action should

consist of rehabilitation or reconstruction of at least one access taxiway to serve the designated primary and crosswind runways.

Short-Term Requirements:
Existing connector taxiways should be reconstructed to a design strength of 30,000 pounds SWG, with design consideration for possible future upgrade to accommodate 60,000 pound ARC B-II aircraft.

Ultimate Requirements:
Strengthening of all taxiway pavements which will be used by heavy aircraft to a design strength of 60,000 pounds should be considered in the ultimate term, only as dictated by actual future demand.

Construction of a full parallel taxiway is recommended as a part of the ultimate development program. This taxiway should be a minimum of 35' wide, constructed to serve a 60,000 pound ARC C-II aircraft, only as dictated by actual future demand.

AIRPORT LIGHTING AND MISCELLANEOUS REQUIREMENTS

Adequate visual aids are a necessity for safe operation of an all-weather facility such as the BDI Airport. Runway and taxiway edge lighting, approach lighting adequate for the published approaches, and security lighting should be addressed in the development schedules.

The existing Medium Intensity Runway Lighting (MIRL) system on Runway 17-35 and 8-26 is in poor, but operable condition. However, the system is near the end of its useful life and maintenance costs are becoming burdensome.

The existing VASI-2 lights at the approach end of Runway 35 is in fair condition. Depending upon the selected alternate for ultimate development, these lighting aids may require replacement or relocation.

The existing rotating beacon (on Hangar #4) is in good condition, and is adequate for this installation, but should be replaced with a more up to date design. The existing lighted wind cone is in fair condition.

Immediate Requirements:
The Primary runway should be equipped with a new base-mounted Medium Intensity Runway Lighting (MIRL) system. All wiring should be installed in duct, if economically feasible.

Medium Intensity Taxiway Lighting (MITL) system should be installed concurrent with access taxiway reconstruction.

Short-Term Requirements:
An MIRL system should be installed on the Crosswind runway concurrent with its reconstruction.

Medium Intensity Taxiway Lighting (MITL) should be installed concurrent with the additional Crosswind runway access taxiway reconstruction.

The lighted wind cone should be rehabilitated as soon as is practical, and the rotating beacon should be replaced.

The ultimate airport visual aids should include installation of Precision Approach Path Indicators (PAPI) on all runway ends.

Ultimate Requirements:
A Medium Intensity Taxiway Lighting (MITL) system should be installed as a part of the parallel taxiway development program.

Apron and parking area floodlighting should be installed concurrent with expansion of these areas.

AIRCRAFT PARKING AND STORAGE REQUIREMENTS

The airport currently has a Portland Cement Concrete (PCC) surfaced aircraft parking ramp with provision for 12 aircraft tiedowns, in a nonstandard configuration.

The number of required tiedown spaces for based and transient aircraft use was determined by applying the following criteria:

- Approximately 81% of the total peak daily operations are assumed to be by transient aircraft at the present time (Potential 1997 Activity scenario). This will decrease to about 72% by the year 2016.
- Most visiting aircraft will arrive and depart on the same day. The actual number of peak transient aircraft is one-half the transient daily operations.
- Seventy-five percent of the transient aircraft will be on the ground during the peak period.

- Ten percent of the based aircraft may also be on the apron temporarily or seasonally.

- In addition to adequate parking to accommodate transient and based aircraft, a passenger loading apron and transient parking ramp for large aircraft and corporate jets is also required, located adjacent to the terminal building.

The following calculations were made to derive the recommended number of tiedown spaces to be provided on the parking apron in the present and ultimate scenarios.

Where: D = Average Daily Peak Operations.
T = Total daily peak transient operations.
N = Number of required tiedowns for transients.
B = Number of based aircraft.
S = Total number of recommended tiedowns.

For base year (Potential 1997 Activity) condition:

T = D (0.81) = 79(0.81) = 63.99
N = (T/2) 0.75 = (63.99/2)0.75 = 24.00
N = 24
S = (0.10 (B))+N = (0.10 (24))+24 = 26.40 = 26

For Ultimate 2016 condition:

T = D (0.72) = 141(0.72) = 101.52
N = (T/2)0.75 = (101.52/2)0.75 = 38.07
N = 38
S = (0.10 (B))+N = (0.10(63))+38= 44.30 = 44

Because of the sometimes severe summer weather experienced in southeastern Arizona, it is assumed that most based aircraft owners will prefer to park their aircraft within a hangar, if available at a reasonable cost. For this reason, adequate land area for hangar construction should be provided for all forecast based aircraft through the planning period, assuming an unconstrained growth environment (63 based aircraft by 2016). These may be constructed as required by

private interests upon leased land, or by the County to provide a revenue-producing rental base.

There are four existing multi-aircraft hangars on the airport property. One of these is currently leased by a private entity (Hangar #1), and one is available for storage of private aircraft on a monthly rental basis (Hangar #4). Together, Hangars #2, 3 and 4 will accommodate 18 to 20 aircraft.

It is recommended that Hangars #1 and #3 be restored and made available to aviation-oriented businesses on a lease basis, and that Hangar #2 be restored as a potential Air Museum site, or similar use. This would eliminate some currently available hangar space, necessitating construction of new hangars for aircraft storage.

A recommended Terminal Area Layout has been prepared and is presented in Figure 6-1 at the end of this section.

Immediate Requirements:
Adequate hangar development land area should be provided by the County on a lease basis to allow the construction of additional hangars as dictated by demand.

Short-Term Requirements:
It is recommended that the entire existing 75' wide Portland Cement Concrete (PCC) aircraft parking apron/taxiway be rehabilitated and maintained to provide taxiway access to the existing and ultimate hangar and business development areas.

A new passenger loading area and large aircraft transient ramp should be constructed in front of the Terminal Building. This ramp should be constructed to a design strength of 30,000 pounds SWG, with design consideration for future strengthening to accommodate 60,000 pound aircraft. (Areas which will only be traversed by small aircraft may be constructed to 12,500 pound design strength.) Parking spaces which will be occupied by larger aircraft should be constructed of Portland Cement Concrete (PCC) pavements, if economically feasible, in order to better accommodate sustained loads by high-pressure tires.

The new paved parking apron should also be expanded to include space for 26 standard-configuration tiedown spaces in order to accommodate current and short-term projected peak conditions.

Ultimate Requirements:
The ultimate apron configuration must provide tiedown space for a minimum future total of 44 aircraft.

General Building Code Compliance and Occupancy Requirements

There are seven main building structures within the BDI Airport's terminal area. Section 2 of this study presents the findings of the site inventory and evaluation of the condition of each building.

Any new building construction, or additions or major alterations of existing buildings on the airport will be subject to the requirements of the Uniform Building Code (UBC). Commercial uses in new and remodeled buildings will also be subject to the Americans with Disabilities Act (ADA) requirements for handicapped access.

The County will not be required to upgrade the existing buildings to meet the latest building code unless the existing conditions are deemed to be unsafe by the local building official (County Public Works Director or Building Inspector). The only existing conditions which may be regarded as unsafe are the electrical systems and the existence of asbestos in the Terminal Building's acoustic ceiling tiles and exterior siding, and the exterior siding of Hangar #4.

The focus of initial building improvements should be in abatement of hazardous materials, upgrade of the existing electrical systems, and exterior rehabilitation which will serve to attract prospective tenants. After the needs of the tenants are known (electrical, fire systems, plumbing and partitioning), interior improvements can be made to suit their requirements. Compliance with architectural and life safety criteria is based on the type of occupancy of the buildings. Therefore, they should be considered as "shell" structures until the occupant uses are known, in order to avoid speculative costs which may not meet the ultimate tenant's needs.

Terminal Building Requirements and Recommendations

The Estimated Peak Hourly Demand, as established in Section 4, was used to arrive at an estimate of the required Terminal Building area for the anticipated general aviation demands through the planning period. A basic criteria of 50 square feet of building space per peak hour passenger or pilot was applied to the assumed rate of 2.5 occupants per peak hour aircraft.

Using this criteria, the estimated minimum Terminal building space

for the 1997 time frame is (2.5)(50)(9) or 1,125 square feet. The minimum space required to serve general aviation needs for the year 2016 will be (2.5)(50)(16) or 2,000 square feet.

The Terminal Building may also be required to accommodate commuter airline service in the future.

The airline passenger terminal functions as the interface between air and ground transportation - the airside/landside link in the air travel system. Its primary purpose is to provide for the safe, comfortable and efficient transfer of passengers and baggage to and from aircraft and ground transportation. In order to accomplish this, adequate facilities for passenger ticketing and processing, baggage handling, and public convenience are necessary.

Airline terminal facilities must be able to accommodate compressed peak passenger and baggage conditions, and are usually remotely located from urban centers. This neccessitates the need for adequate roadway access and vehicular parking facilities to a greater extent than that which is expected at other types of transportation terminals.

In most cases, terminals at non-hub airports serve charter flights, air taxi, and general aviation activities, in addition to scheduled airlines.

The primary airport terminal occupants are the airlines. However, a number of tenants may also utilize space in the building or building complex. Depending on the size of the airport, these may include food service operators, concessionaires, fixed base operators, rental car services, air taxi, and parking lot operators.

The space requirements to serve the possibility of future commuter airline service were determined by application of the TermFac computer program, which is based on the basic space planning factors contained in FAA Advisory Circular AC 150/5360-9, Planning and Design of Airport Terminals at Non-Hub Locations. The following assumptions were made concerning scheduled airline activity within the planning period:

- It was assumed that the maximum potential airline traffic at BDI will consist of two daily flights by a single serving airline, with at least one other stop.

- One airline parking position will be provided.

- One secured passenger gate will be provided.
- Service by Beechcraft 1900's, which will accommodate 19 passengers, was assumed.
- Based on national averages from the FAA Aviation Forecasts, the assumed average passenger load factor is 50%, with half of these enplaning at BDI.

Using the above assumptions, the maximum number of enplaned passengers within the planning period is (19)(2)(0.25)(365) = 3,467.5, or about 3,500 annual enplanements. Peak hour passengers will probably not exceed those arriving and departing on a single flight, or 10 passengers.

The following tabulation is the output recommendations (including general aviation requirements) from the TermFac program, based on the above assumptions:

Bisbee-Douglas International Airport
NON-HUB TERMINAL BUILDING SPACE REQUIREMENTS

Initial Planning Year	2016
Total Annual Passenger Enplanements	3,500
Peak Hour Originating Passengers	5
Peak Hour Terminating Passengers	5
Peak Hour General Aviation Movements	16
Number of Commuter Gates	1
Number of Serving Airlines	1
Number of Airline Parking Positions	1

Waiting area/lobby space	79 S.F.
Airline ticket counter length	11 L.F.
Airline ticket counter queue area	22 S.F.
Airline offices/outbound baggage area	887 S.F.
Inbound baggage claim length	11 L.F.
Inbound baggage public area	499 S.F.
Inbound baggage handling area	165 S.F.
Departure holdroom area	1,000 S.F.
Total food and beverage area	556 S.F.
(Restaurant/snack bar area	250 S.F.)
(Kitchen/food preparation area	139 S.F.)
(Cocktail lounge area	139 S.F.)
(Restaurant waiting/stg. area	28 S.F.)
Rental car counter length	11 L.F.
Rental car counter queue area	22 S.F.
Rental car office space	110 S.F.
Number of public telephones	0
Public telephone area	0 S.F.
Public circulation area	1,975 S.F.
Public restroom area	60 S.F.
Airport management offices	2,500 S.F.
General aviation terminal space	2,000 S.F.
TOTAL AREA REQUIRED (ULTIMATE)	**7901 S.F.**

Reference: AC 150/5360-9

The existing Terminal Building provides 8,850 square feet of useable space.

Short-Term Requirements:
The existing Terminal Building will be adequate to meet the immediate, short-term and ultimate general aviation demands, based on the above calculations. The Terminal Building should be placed on the State and Federal Register of Historic Places, and application should be made for an Historic Preservation grant to fund building restoration.

The recommended Short-Term improvements to the Terminal Building are summarized as follows:

- Place on Register of Historic Places.
- Restore to 1950's-era airline terminal configuration.
- Hazardous materials (asbestos) abatement.
- Rehabilitate interior (including Cafe).
- Provide adequate handicap access.

Ultimate Requirements:
If future scheduled airline service is initiated, the Terminal Building will require some modification to provide for baggage handling, airport security, and accommodation of passenger service vendors.

HANGARS #1, #2 AND #3 RENOVATION REQUIREMENTS AND RECOMMENDATIONS

Hangars #1, #2 and #3 are steel-framed structures with corrugated galvanized steel siding. They were originally used for large aircraft (bomber) storage as part of the wartime use of the Douglas Army Airfield. The exteriors of these hangars are in essentially the same configuration as originally constructed. The hangars have definite historical significance.

Hangars #1 and #3 should be leased to future aviation-industrial or commercial tenants. Hangar #2 should be considered for future development as an Air Museum.

Short-Term Requirements:
The focus of short-term improvements should be on rehabilitation of the existing buildings such that they will be attractive to new aviation-related businesses. Exterior rehabilitation may be eligible for funding under an Historic Preservation Grant. Interior improvements should be limited to necessary building code upgrades and cosmetic repairs.

Recommended Short-Term improvements for existing Hangars #1, #2 and #3 are summarized as follows:

- Place on Register of Historic Places.
- Restore exteriors to World War II airbase configuration.
- Replace electrical system.
- Rehabilitate interiors (sandblast and paint).
- Rehabilitate hangar doors.
- Replace broken window glass.

Ultimate Requirements:
Ultimate improvements to the Hangars should be designed to accommodate the needs of the various tenants. Because of the requirements of the Historic Preservation Grant, tenant improvements and remodeling must be limited to the building interior.

HANGAR #4 RENOVATION REQUIREMENTS AND RECOMMENDATIONS

Hangar #4 is a wood framed structure with asbestos siding. It was originally used for aircraft storage as part of the wartime use of the Douglas Army Airfield. The exteriors of the hangar is in essentially the same configuration as originally constructed. The hangar has definite historical and architectural significance.

Short-Term Requirements:
Exterior rehabilitation of Hangar #4 may be eligible for funding under an Historic Preservation Grant. It is recommended that this building remain in its current use for storage of local aircraft.

Recommended Short-Term improvements for existing Hangar #4 are summarized as follows:

- Place on Register of Historic Places.
- Restore exterior to World War II airbase configuration.
- Replace electrical system.
- Rehabilitate interior (minimal).
- Rehabilitate hangar doors.
- Replace broken window glass.

Ultimate Requirements:
Because of the requirements of the Historic Preservation Grant, future improvements and remodeling must be limited to the building interior.

BUILDING #2 RECOMMENDATIONS

Building #2 was originally a part of the Douglas Army Airfield, probably functioning as a hangar for large aircraft storage. Most recently, this building served as a Cannery and warehouse. It has been vacant for several years.

The original building consisted of a 14,000 square foot wood-frame building with a dual barrel roof structure. Over the years, several additions were constructed, increasing the building to a current size of about 41,000 square feet. As was discussed in Section 2, Building #2 was found to be in rather poor condition, with the probability of expensive structural repairs and upgrades. An exception to this is the newer 21,400 square foot steel-framed addition at the south end of the complex, as well as the 5,700 square foot steel-framed garage/loading area and steel-framed parking canopy at the north end.

Short-Term Requirements:
It is recommended that the original 14,000 square foot wood-frame portion of Building #2 be razed. The remaining steel-framed portions of the building complex should be upgraded to current building code requirements, and the area between the two should be made available for private development as an airport/industrial building site.

The Short-Term recommendations for Building #2 are summarized as follows:

- Raze original 14,000 SF wood-frame structure.
- Rehabilitate steel-frame additions as stand-alone buildings.
- Replace electrical systems in steel-frame buildings.

Ultimate Requirements:
Ultimate improvements to the remaining portions of Building #2 should be designed to accommodate the needs of the ultimate tenants.

BUILDING #3 RECOMMENDATIONS

Building #3 was found to be in very poor condition, with apparent foundation and floor slab damage, and a severely leaking roof which has caused some structural degradation. This building has been vacant for quite a while. The cost of rehabilitiation and upgrade to current building codes would be prohibitive when compared to replacement with a new building of similar size. The original use and possible historical significance of the building cannot be determined from existing records.

Short-Term Requirements:
It is recommended that Building #3 be razed, and the site be made available for private hangar or Fixed Base Operator development.

Cost estimates for recommended building improvements are included in the Preliminary Airport Building Budget Projections at the end of this section (beginning on Page 6-34).

AUTOMOBILE PARKING AND ACCESS REQUIREMENTS

The Estimated Peak Hourly Demand was also used as a basis to estimate the projected requirements for automobile parking. The criteria used is a factor of 3.25 automobiles per peak hour operation. This factor allows for 2.5 occupants per aircraft operation during the peak hour, plus allowance for airport employees and visitors.

The estimated automobile parking requirements for the present time frame is, therefore, (3.25)(9) or approximately 29 spaces. The required spaces for the year 2016 constrained condition will be (3.25)(16) or 52 spaces.

Cochise County also has specific automobile parking requirements for various types of commercial development. The automobile parking spaces included above will be adequate only to accommodate the projected general aviation related activity at the airport.

A tabulation of the County's requirements for automobile parking is included at the end of this section.

Short-Term Requirements:
The existing paved automobile parking area will accommodate approximately 25 cars. The pavement is near the end of its useful life and should be replaced. Reconstruction and expansion of the automobile parking area to accommodate the short-term demand of 29 cars should be included as part of the Short-Term development.

Ultimate Requirements:
The auto parking area(s) should be expanded in the future to accommodate a total of 52 cars as dictated by actual demand.

ROTORCRAFT FACILITIES

The forecasts developed in Section 3 indicate that operations by helicopters may increase to over 2,500 annual operations within the planning period. To accommodate this, a lighted helipad and short-term helicopter parking area should be included in the ultimate term improvement program. The timing of its construction should be based upon actual demand.

Ultimate Requirements:
A 48' x 48' paved and marked Touchdown and Lift-off Area (TLOF), with an 86' x 110' Final Approach and Takeoff Area (FATO) will accommodate virtually all general aviation rotorcraft. A smaller area may be specified based upon actual usage prior to the helipad development.

LAND ACQUISITIONS

The existing airport property will be adequate for all recommended development through the ultimate planning period (depending upon the selected development alternative - see Section 7). This will be true with the exception of land acquisitions for avigation easements to cover the ultimate Runway Protection Zones (RPZ) and Primary Surface for Runway 8-26.

DEVELOPMENT PHASING PLAN

The following tables on the following pages are a summary of the recommended facility improvements to be constructed within the Immediate, Short-Term and Ultimate time frames.

IMMEDIATE TERM DEVELOPMENT PLAN
Bisbee-Douglas International Airport
1997-1999

Acquire easements for approach protection of the ultimate airport development layout.

Close Runway 8-26.

Reconstruct Primary runway (7,300' x 100') to 30,000 pound SWG design strength.

- Install Medium Intensity Runway Lighting (MIRL) on Primary Runway.
- Remove any obstructions to FAR Part 77 surfaces.

Reconstruct access taxiways to serve the Primary runway (30,000 pound SWG design strength).

- Install Medium Intensity Taxiway Lighting (MITL) on reconstructed access taxiways.

Designate adequate land area for private hangar development.

SHORT-TERM DEVELOPMENT PLAN
Bisbee-Douglas International Airport
2000-2005

Reconstruct 5,850' x 100' Crosswind runway to 30,000 pound SWG design strength.

- Install Medium Intensity Runway Lighting (MIRL) on Crosswind runway.

Install Medium Intensity Approach Lighting System with RAIL (MALSR) on Primary runway.

Reconstruct additional access taxiways to serve the Primary and Crosswind runway (30,000 pound SWG design strength -35' minimum pavement width).

- Install Medium Intensity Taxiway Lighting (MITL) on reconstructed access taxiways.

Rehabilitate existing lighted wind cone and segmented circle.

Install Precision Approach Path Indicators (PAPI) on all runway ends (4).

Rehabilitate entire existing 75' wide PCC apron/taxiway.

Construct new passenger loading/service apron and large aircraft transient ramp adjacent to Terminal Building (30,000 pound SWG design strength).

Construct new light aircraft parking apron (12,500 pound SWG design strength), with 26 aircraft tiedown positions.

Renovate Terminal Building (restore to 1950's airline terminal configuration under Historic Preservation Grant).

- - - continued - - -

SHORT-TERM DEVELOPMENT PLAN
Bisbee-Douglas International Airport
2000-2005
Page 2 of 2

Renovate Hangars #1, #2, and #3 (restore to World War II Douglas Army Airfield configuration under Historic Preservation Grant).

Renovate Hangar #4 (restore to World War II Douglas Army Airfield configuration under Historic Preservation Grant).

Remove original wood-frame portion of Building #2, and rehabilitate remaining steel-frame portions as "shell" buildings for tenant development.

Remove Building #3.

Reconstruct and expand the Terminal Building automobile parking area to accommodate a minimum of 29 cars.

ULTIMATE-TERM DEVELOPMENT PLAN
Bisbee-Douglas International Airport
2006-2016
Page 1 of 2

Upgrade Primary runway to accommodate 60,000 pound aircraft.

Extend Primary runway to 8,700' x 100' (1,400' extension).

- Prepare Environmental Assessment for proposed Primary runway extension and precision approach.
- Provide precision instrument approach to Primary runway (ILS, DGPS or TLS).

Upgrade Crosswind runway to accommodate 60,000 pound aircraft.

Extend Crosswind runway to 7,000' x 100' (1,150' extension).

- Prepare Environmental Assessment for proposed Crosswind runway extension.
- Provide straight-in nonprecision instrument approach to Crosswind runway (VOR or GPS).

Strengthen all taxiways which will be used by larger aircraft to accommodate 60,000 pound design strength.

Construct full parallel taxiway access to Primary runway (35' minimum pavement width).

- Install Medium Intensity Taxiway Lighting (MITL) on new parallel taxiway.

- - - continued - - -

ULTIMATE-TERM DEVELOPMENT PLAN
Bisbee-Douglas International Airport
2006-2016
Page 2 of 2

Expand light aircraft parking apron (12,500 pound SWG design strength), to accommodate a total of 44 aircraft tiedown positions (18 additional aircraft).

Expand the Terminal Building automobile parking area to accommodate a minimum total of 52 cars (23 additional cars).

- Install apron and parking area floodlighting.

Modify Terminal Building to accommodate scheduled airline service.

Provide interior tenant improvements as required for renovated Hangars #1, #2 and #3.

Provide interior tenant improvements as required for renovated Hangar #4.

Provide interior tenant improvements as required for renovated Building #2.

Construct a paved and lighted Helipad with 48' x 48' TLOF, 86' x 110' FATO, and adjacent short-term rotorcraft parking area.

PRELIMINARY AIRPORT BUILDING BUDGET PROJECTIONS

The following estimates have been compiled as a result of a preliminary walk-through performed at the site, and data collected from contractors and suppliers without the benefit of a detailed investigation. Items and costs specified are for preliminary budgetary use only. A thorough exploratory investigation is recommended after budgets have been established, which will allow a more detailed estimation of costs, and be the basis of the design for the building renovations.

With exception of the terminal building, these preliminary costs assume "shell" improvements only, which renovate or repair the structures to make ready for a specific tenant's required improvements.

Terminal Building Budget Estimate

Interior renovations ..... $150,000 to $350,000

Exterior asbestos abatement (category 2) $12,200
Source: Southwest Hazard Control of Phoenix

Replace exterior siding or stucco $13,500

Exterior remodeling and ADA compliance ... $50,000 to $170,000

Total (Terminal) ..... $225,700 to $545,700

Building #2 Budget Estimate (Vacant Cannery/Warehouse)

Option 1: Demolish original 14,000 square foot wood structure. Replace with new metal structure and foundation to match existing metal additions:

Demolition $42,000
Source: Herman and Son's Excavation of Phoenix

Replace new metal structure, foundation and slab $215,500
Source: *LMB Building Solutions of Phoenix*

General Contractor's profit, overhead and sales tax $72,500

Total Option 1 (Building #2) $292,200

Option 2: Interior cleanup, repair slabs, demolish small wood frame additions, repair window and doors, and repair water damaged roof structure.

Total Option 2 (Building #2) $95,000

Building #3 Budget Estimate

Demolish entire structure, fill and compact foundations . **$15,000**
Source: Herman and Son's Excavation of Phoenix

Hangar #4 Budget Estimate

Exterior asbestos abatement (catagory 2) $29,700
Source: Southwest Hazard Control of Phoenix.

Replace siding or stucco $32,500

Exterior Paint $11,500

Repair/rehabilitate hangar doors $1,500

Reglazing as needed $3,500

General Contractor's profit,
overhead and sales tax $23,500

Total (Hangar #4) $72,500

Hangar #1, #2 and #3 Budget Estimate

Rehabilitate interiors on the unoccupied hangars. Replace roofing, sandblast exteriors, repair hangar doors, reglaze windows as needed.

Interior cleanup and repair $9,500

Remove and replace 24 gauge corrugated metal roof $26,700
Source: Custom Roofing of Phoenix

Repair/service hangar doors $1,500

Reglazing as needed $7,500

Sandblast exterior metal siding $3,200

Subtotal (Each Hangar) *$48,400*

Subtotal of 3 ..... *$145,200*

General Contractor's profit, overhead, and sales tax $41,500

TOTAL ESTIMATE (Three Hangars) $186,700

Note: Architectural and engineering services are excluded from the estimates.

Bisbee-Douglas International Airport
FAA Airport Design Program Output

AIRPORT AND RUNWAY DATA

Airport elevation	4151 feet
Mean daily maximum temperature of the hottest month	90.00 F.
Maximum difference in runway centerline elevation	44 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
Wet and slippery runways	

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	420 feet
Small airplanes with approach speeds of less than 50 knots	1130 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	4070 feet
95 percent of these small airplanes	5340 feet
100 percent of these small airplanes	5650 feet
Small airplanes with 10 or more passenger seats	5650 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	6690 feet
75 percent of these large airplanes at 90 percent useful load	9040 feet
100 percent of these large airplanes at 60 percent useful load	8920 feet
100 percent of these large airplanes at 90 percent useful load	10480 feet
Airplanes of more than 60,000 pounds	Approximately 6470 feet

REFERENCE: AC 150/5325-4A, RUNWAY LENGTH REQUIREMENTS FOR AIRPORT DESIGN.

Existing Configuration: Nonprecision Approach / ARC C-II

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category C
Airplane Design Group II (Large Airplanes)
Airplane wingspan . . . . . 78.99 feet
Primary runway end is nonprecision instrument > 3/4-statute mile
Other runway end is visual
Airplane undercarriage width (1.15 x main gear track) . . . 9.00 feet
Airport elevation . . . . . 4151 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane	Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations		700 feet
VFR operations with intervening taxiway		700 feet
VFR operations with two intervening taxiways		705 feet
IFR approach and departure with approach to near threshold		2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 ft.
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is a factor:		
VFR operations		2500 feet
IFR departures		2500 feet
IFR approach and departure with approach to near threshold		2500 feet
IFR approach and departure with approach to far threshold		2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches		3400 feet
Runway centerline to parallel taxiway/taxilane centerline	239.4	300 feet
Runway centerline to edge of aircraft parking	400.0	400 feet
Taxiway centerline to parallel taxiway/taxilane centerline	104.8	105 feet
Taxiway centerline to fixed or movable object	65.3	65.5 feet
Taxilane centerline to parallel taxilane centerline	96.9	97 feet
Taxilane centerline to fixed or movable object	57.4	57.5 feet
Runway protection zone at the primary runway end:		
Length		1700 feet
Width 200 feet from runway end		500 feet
Width 1900 feet from runway end		1010 feet
Runway protection zone at other runway end:		
Length		1000 feet
Width 200 feet from runway end		500 feet
Width 1200 feet from runway end		700 feet
Departure runway protection zone:		
Length		1700 feet
Width 200 feet from the far end of TORA		500 feet
Width 1900 feet from the far end of TORA		1010 feet

Runway obstacle free zone (OFZ) width	400.0	400 feet
Runway obstacle free zone length beyond each runway end		200 feet
Approach obstacle free zone width	400.0	400 feet
Approach obstacle free zone length beyond approach light system		200 feet
Approach obstacle free zone slope from 200 feet beyond threshold		50:1
Inner-transitional surface obstacle free zone slope		0:1
Runway width		100 feet
Runway shoulder width		10 feet
Runway blast pad width		120 feet
Runway blast pad length		150 feet
Runway safety area width		400 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		1000 feet
Runway object free area width		800 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		1000 feet
Clearway width		500 feet
Stopway width		100 feet
Taxiway width	24.0	35 feet
Taxiway edge safety margin		7.5 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	79.0	79 feet
Taxiway object free area width	130.6	131 feet
Taxilane object free area width	114.8	115 feet
Taxiway wingtip clearance	25.8	26 feet
Taxilane wingtip clearance	17.9	18 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

Threshold surface at other runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

REFERENCE: AC 150/5300-13, AIRPORT DESIGN.

Ultimate Configuration: Precision Approach / ARC C-II

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category C	
Airplane Design Group II (Large Airplanes)	
Airplane wingspan	78.99 feet
Primary runway end is precision instrument 1/2-statute mile or less	
Other runway end is nonprecision instrument 3/4-statute mile	
Airplane undercarriage width (1.15 x main gear track)	9.00 feet
Airport elevation	4151 feet
Airplane tail height	15.00 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane	Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations		700 feet
VFR operations with intervening taxiway		800 feet
VFR operations with two intervening taxiways		905 feet
IFR approach and departure with approach to near threshold		2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 ft.
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is a factor:		
VFR operations		2500 feet
IFR departures		2500 feet
IFR approach and departure with approach to near threshold		2500 feet
IFR approach and departure with approach to far threshold		2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches		3400 feet
Runway centerline to parallel taxiway/taxilane centerline	245.0	400 feet
Runway centerline to edge of aircraft parking	400.0	500 feet
Taxiway centerline to parallel taxiway/taxilane centerline	104.8	105 feet
Taxiway centerline to fixed or movable object	65.3	65.5 feet
Taxilane centerline to parallel taxilane centerline	96.9	97 feet
Taxilane centerline to fixed or movable object	57.4	57.5 feet
Runway protection zone at the primary runway end:		
Length		2500 feet
Width 200 feet from runway end		1000 feet
Width 2700 feet from runway end		1750 feet
Runway protection zone at other runway end:		
Length		1700 feet
Width 200 feet from runway end		1000 feet
Width 1900 feet from runway end		1510 feet
Departure runway protection zone:		
Length		1700 feet
Width 200 feet from the far end of TORA		500 feet
Width 1900 feet from the far end of TORA		1010 feet

Runway obstacle free zone (OFZ) width	400.0	400 feet
Runway obstacle free zone length beyond each runway end		200 feet
Approach obstacle free zone width	400.0	400 feet
Approach obstacle free zone length beyond approach light system		200 feet
Approach obstacle free zone slope from 200 feet beyond threshold		50:1
Inner-transitional surface obstacle free zone slope		3:1
Runway width		100 feet
Runway shoulder width		10 feet
Runway blast pad width		120 feet
Runway blast pad length		150 feet
Runway safety area width		400 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		1000 feet
Runway object free area width		800 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		1000 feet
Clearway width		500 feet
Stopway width		100 feet
Taxiway width	24.0	35 feet
Taxiway edge safety margin		7.5 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	79.0	79 feet
Taxiway object free area width	130.6	131 feet
Taxilane object free area width	114.8	115 feet
Taxiway wingtip clearance	25.8	26 feet
Taxilane wingtip clearance	17.9	18 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface	200 feet
Width of surface at start of trapezoidal section	1000 feet
Width of surface at end of trapezoidal section	4000 feet
Length of trapezoidal section	10000 feet
Length of rectangular section	0 feet
Slope of surface	34:1

Threshold surface at other runway end:

Distance out from threshold to start of surface	200 feet
Width of surface at start of trapezoidal section	1000 feet
Width of surface at end of trapezoidal section	4000 feet
Length of trapezoidal section	10000 feet
Length of rectangular section	0 feet
Slope of surface	20:1

REFERENCE: AC 150/5300-13, AIRPORT DESIGN.

BISBEE-DOUGLAS
INTERNATIONAL AIRPORT

A.D.O.C. LEASE AREA

FUTURE AIRPORT INDUSTRIAL PARK

4140

RENOVATE HANGAR #3 (AVIATION–INDUSTRIAL USE)

AUTO PARKING

RENOVATE HANGAR #1 (AVIATION–INDUSTRIAL USE)

STATIC WARBIRD DISPLAY AREA

RENOVATE HANGAR #2 (FUTURE MUSEUM SITE)

4120

35' WIDE TAXIWAY

RECONSTRUCT ACCESS ROAD

REHABILITATE 75' WIDE PCC TAXIWAY/APRON

FUTURE AVIATION–INDUSTRIAL DEVELOPMENT LOTS (120' X 100' LOTS)

35' WIDE TAXIWAY

FUTURE PRIVATE HANGAR DEVELOPMENT LOTS (80' X 100' LOTS)

REMOVE

RENOVATE

BUILDING #2

CANOPY

RENOVATE

RENOVATE TERMINAL

RECONSTRUCT ENTRANCE ROAD

PARKING

REMOVE BUILDING #3

PRIVATE HANGAR DEVELOPMENT (80' X 100' LOTS)

RENOVATE HANGAR #4

TAXIWAY

SERVICE APRON

PHASE 1 APRON

ULTIMATE APRON

PHASE 1 APRON

35' WIDE TAXIWAY

4100

N

1"=400'

Recommended Terminal Area Layout

Figure 6-1

February 25, 1997

Cochise County Automobile Parking Requirements for Commercial Development

TYPE OF DEVELOPMENT	NUMBER OF AUTO PARKING SPACES
Transient Lodgings	1 per guest room or suite of rooms plus 1 per 3 employees.
Manufacturing of Durable and Non-Durable Goods, Fabrication and Assembly of Products, and Services, Processing and Compounding of Materials, Distribution of Goods and Merchandise	1 per 750 square feet of gross floor area or 1 per each 3 employees in the largest working shift, whichever is greater.
Bus, Motor Freight, Taxi and Rail Terminals	1 per 5,000 square feet of gross floor area.
Wholesaling, Warehousing, Distribution and Storage of Durable and Non-Durable Goods	1 per 1,000 square feet of gross floor area.
Restaurants, Bars, Taverns, Nightclubs	1 per 50 square feet of floor area, excluding areas designed for restrooms, storage, service or other non-public purposes.
Swap Meets	1 per 600 square feet of sales area.
Grocery Stores and Convenience Markets	1 per 150 square feet of gross floor area in Category A and B Growth Areas; 1 per 250 square feet of gross floor area in Category C and D Growth Areas.
Automobile Service Stations	1 per 150 square feet of gross floor area.
Outdoor Sales Areas	1 per 250 square feet of floor area if site has an office or enclosed display area. Otherwise; 1 per 3 employees and 1 per 5,000 square feet of display space and customer circulation area.
Retail Trade of Merchandise	1 per 250 square feet of gross leasable floor area in Category A and B Growth Areas; 1 per 350 square feet of gross leasable floor area in Category C and D Growth Areas.
Business Offices, Personal Services, Repair Services, Professional Services	1 per 250 square feet of gross floor area in Category A and B Growth Areas; 1 per 350 square feet of gross floor area in Category C and D Growth Areas.
Hospitals, Sanitariums, Nursing and Convalescent Homes	1 per 3 patient beds, or 1 per patient room, whichever is greater.
Contract Construction Services	1 per 1,000 square feet of floor or display area.
Government Services	1 per 500 square feet of gross floor area.